

LETTER

REPLY TO SCHILD ET AL.:

Antisocial personality moderates the causal influence of costly punishment on trust and trustworthiness

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A growing literature at the intersection of personality psychology and behavioral economics investigates the interplay between personality and decision making in social dilemmas (1, 2). Engelmann et al. (3) extend prior research in this area by investigating the role of antisocial personality in the context of a trust game with and without punishment. Previous research suggested that the possibility to punish individuals who fail to reciprocate trust causes an increase in trust and trustworthiness (4, 5) but remained silent about how antisocial personality affects the causal influence of punishment on trust and trustworthiness.

Some older work in personality psychology reviewed in ref. 6 relied on deception and used hypothetical payments and scenarios. This methodological approach is considered by many as suboptimal and unable to generate valid findings that meaningfully contribute to theory (7). Accordingly, Engelmann et al. (3) used an established approach from experimental economics (nonhypothetical, fully incentivized, nondeceptive) and simultaneously investigated the role of antisocial personality in trust, trustworthiness, and punishment decisions. Results showed that individuals scoring low on the antisocial personality profile (APP), assessed via a combination of established personality questionnaires, extended and reciprocated trust irrespective of the presence or absence of a punishment opportunity. In contrast, those scoring high on APP extended trust only when they could punish possible trust violations (while simultaneously strongly punishing nonreciprocated trust) and reciprocated others' trust only when their trustor could punish failures to reciprocate.

Schild et al. (8) do not question the validity of these insights but suggest, without foundation, that the

data-driven approach to measure APP in ref. 3 hampers understanding of antisocial personality. This critique is difficult to appreciate. The APP measure in ref. 3 has demonstrated 1) construct validity, in that it describes antisocial personality in the same terms as other measures and theory on APP (table S1 in ref. 3), with the reverse-coded ANTI factor); 2) predictive validity, as it clearly identifies behavioral changes in antisocial individuals in the expected direction across all stages of the trust game with and without punishment; and 3) convergent validity, in that it strongly ($r > 0.70$) correlates in the expected direction with an alternative measure of APP (D, ref. 9) (Fig. 1A), and with a general personality measure (HH, ref. 10) (Fig. 1B). Moreover, the APP measure in ref. 3 shows specific effects and has added value over and above other personality constructs (emotional reactivity, sensation seeking, trait anger, and impulsivity) that were included as control variables in all regressions in (3).

From the size and directions of the correlations shown in Fig. 1, it follows that antisocial personality may be a single rather than multidimensional construct. In fact, antisocial personality, whether measured with APP or the dark factor of personality, may be fully subsumed under the more general dimension of honesty–humility (Fig. 1A–C). Whether core facets of interactive decision making, such as trust and trustworthiness under punishment, may be subject to broad personality differences as assessed with the extensively validated HEXACO honesty–humility scale, or more specific measures of antisocial personality, remains a topic for future investigation.

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The authors declare no competing interest.

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First published April 21, 2020.

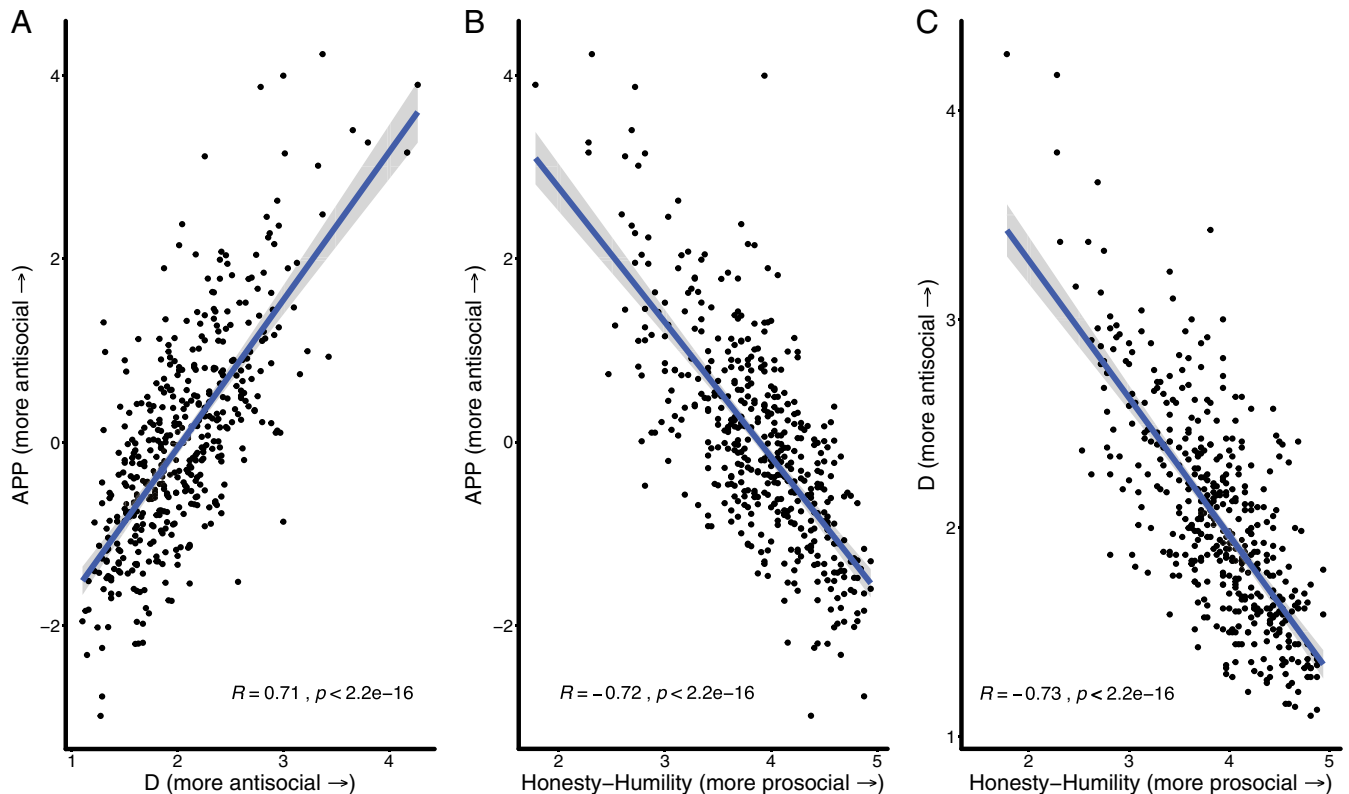


Fig. 1. Correlations between the APP (using the original reverse coding from ref. 3), and (A) the dark factor of personality (D), as well as (B) the HEXACO honesty-humility scale (HH). C shows the negative correlation between D and HH. Data are from ref. 8 and obtained from osf.io (11).

- 1 M. Almlund, A. L. Duckworth, J. Heckman, T. Kautz, "Personality psychology and economics" in *Handbook of the Economics of Education*, E. A. Hanushek, S. Machin, L. Woessmann, Eds. (Elsevier, Noord, The Netherlands, 2011), vol. 4, pp. 1–181.
- 2 C. K. W. De Dreu, J. Gross, *Handbook of Research Methods and Applications in Experimental Economics*, A. Schram, A. Uhle, Eds. (Edward Elgar, Cheltenham, UK, 2019), pp. 214–233.
- 3 J. B. Engelmann, B. Schmid, C. K. W. De Dreu, J. Chumbley, E. Fehr, On the psychology and economics of antisocial personality. *Proc. Natl. Acad. Sci. U.S.A.* **116**, 12781–12786 (2019).
- 4 S. Gächter, E. Fehr, *Economics, Values and Organizations*, A. P. L. Ben-Ner, Ed. (Cambridge University Press, Cambridge, UK, 1998), pp. 337–363.
- 5 E. Fehr, S. Gächter, G. Kirchsteiger, Reciprocity as a contract enforcement device: Experimental evidence. *Econometrica* **65**, 833–860 (1997).
- 6 I. Thielmann, G. Spadaro, D. Balliet, Personality and prosocial behavior: A theoretical framework and meta-analysis. *Psychol. Bull.* **146**, 30–90 (2020).
- 7 R. Hertwig, A. Ortmann, Experimental practices in economics: A methodological challenge for psychologists? *Behav. Brain Sci.* **24**, 383–403, discussion 403–451 (2001).
- 8 C. Schild, K. A. Ścigała, I. Zettler, Multiple antisocial personalities? *Proc. Natl. Acad. Sci. U.S.A.* **117**, 9688–9689 (2020).
- 9 M. Moshagen, B. E. Hilbig, I. Zettler, The dark core of personality. *Psychol. Rev.* **125**, 656–688 (2018).
- 10 K. Lee, M. C. Ashton, Psychometric properties of the HEXACO personality inventory. *Multivariate Behav. Res.* **39**, 329–358 (2004).
- 11 C. Schild, K. A. Ścigała, I. Zettler, Data from "Multiple antisocial personalities?" Open Science Framework. <https://osf.io/jtnfs/>. Accessed 20 December 2019.